

## **CLAIMS**

1. (Currently Amended) A computerized method comprising:

identifying, from a plurality of objects, a set of core objects for a data structure corresponding to a community of objects by identifying one or more objects that are referenced by at least a threshold number of other objects of the plurality of objects;

expanding, based on the set of core objects, the community of objects to include a set of affiliated objects, wherein the set of core objects and the set of affiliated objects are maintained as distinct entities within the data structure;

accessing at least one element of the data structure with a processor of a computer;

assigning the set of core objects to a center portion of a user interface independent model;

assigning each affiliated object in the set of affiliated objects to a particular concentric portion around the center of the model; and

merging together a first community of the plurality of communities and a second community of the plurality of communities in response to a finding of similarity between the core objects in the first community and the core objects in the second community;

wherein each concentric portion represents an importance level to the community and the closer each concentric portion is to the center portion represents a higher level of importance for the affiliated objects with that concentric portion and that each affiliated object within each concentric portion shares the same importance level.

2. (Original) A method as recited in claim 1, further comprising:  
repeating the identifying and expanding for a plurality of communities of objects,  
wherein the objects in each community of objects are all from the plurality of objects.

3. (Previously Presented) A method as recited in claim 2, wherein the merging  
results in a merged community including all of the objects of the first community and the  
second community and having a set of core objects that includes the core objects in the  
first community and the core objects in the second community.

4. (Original) A method as recited in claim 2, further comprising:  
merging together a first community of the plurality of communities and a second  
community of the plurality of communities if there is sufficient similarity between the  
core and affiliated objects in the first community and the core and affiliated objects in  
the second community.

5. (Original) A method as recited in claim 2, further comprising:  
identifying a first community of the plurality of communities and a second  
community of the plurality of communities;  
determining whether the first community and second community satisfy one or  
more constraints; and  
merging the first community and the second community if the one or more  
constraints are satisfied, wherein the merging results in a merged community including  
all of the objects of the first community and the second community.

6. (Original) A method as recited in claim 2, wherein one of the plurality of objects is one of the set of core objects for the community of objects, and is one of the set of affiliated objects for another community of objects.

7. (Original) A method as recited in claim 2, wherein one of the plurality of objects is one of the set of core objects for multiple communities.

8. (Original) A method as recited in claim 2, wherein one of the plurality of objects is one of the set of affiliated objects for multiple communities.

9. (Previously Presented) A method as recited in claim 1, wherein identifying the set of core objects for the community comprises:

identifying links between objects of the plurality of objects;

finding groups of objects of the plurality of objects that satisfy a link threshold;

and

identifying, as a core set, one or more of the groups of objects that satisfy the link threshold.

10. (Canceled)

11. (Previously Presented) A method as recited in claim 1, wherein expanding the data structure corresponding to the community of objects comprises:

identifying links between objects of the plurality of objects;

identifying one or more objects of the plurality of objects, wherein a link exists from each of the identified one or more objects to at least one of the core objects of the set of core objects; and

including, in the set of affiliated objects, each of the identified one or more objects.

12. (Previously Presented) A method as recited in claim 11, wherein a rank is assigned to each affiliated object in the set of objects, the affiliated object being assigned to a particular concentric portion around the center of the model in accordance with the rank of the affiliated object.

13. (Original) A method as recited in claim 11, further comprising:

ranking each affiliated object in the set of affiliated objects in accordance with the number of links from the affiliated object to core objects of the set of core objects, wherein affiliated objects having a larger number of links to core objects have higher rankings.

14. (Original) A method as recited in claim 1, wherein each of the plurality of objects comprises a document.

15. (Original) A method as recited in claim 14, further comprising:

identifying a plurality of links, wherein each link links one object to another object, and wherein each of the plurality of links represents a citation in one document to another document.

16. (Original) A method as recited in claim 1, wherein each of the plurality of objects comprises a person.

17. (Original) A method as recited in claim 16, further comprising:

identifying a plurality of links, wherein each link links one object to another object, and wherein each of the plurality of links represents a relationship of one person to another person.

18. (Original) A method as recited in claim 1, wherein each of the plurality of objects comprises a web page.

19. (Original) A method as recited in claim 18, further comprising:

identifying a plurality of links, wherein each link links one object to another object, and wherein each of the plurality of links represents a hyperlink in one web page to another web page.

20. (Currently Amended) One or more tangible computer readable media having stored thereon a plurality of instructions that, when executed by one or more processors of a device, causes the one or more processors to:

identify, from a plurality of objects, a first collection of objects to be a core of a community;

identify, from the plurality of objects, a second collection of objects that are linked to the first collection of objects wherein the second collection of objects are affiliate objects;

assign the first collection of objects to a center portion of a user interface independent model;

assign each object of the second collection of objects to a particular concentric portion around the center of the model; and

add to the community, the second collection of objects, wherein the first collection of objects and the second collection of objects are maintained as distinct entities within the data structure;

wherein each concentric portion represents an importance level to the community and the closer each concentric portion is to the center portion represents a higher level of importance for the affiliated objects with that concentric portion and that each affiliated object within each concentric portion shares the same importance level.

21. (Canceled)

22. (Currently Amended) One or more tangible computer readable media as recited in claim [[0]] 20, wherein the plurality of instructions, when executed by the one or more processors, further cause the one or more processors to:

identify, from the plurality of objects, additional first collections of objects to be cores of additional communities;

identify, from the plurality of objects, additional second collections of objects that are linked to the first collections of objects to be affiliated objects of the additional communities; and

add, to the additional communities, the respective additional second collections of objects

add, to structures corresponding to the additional communities, the respective additional second collections of objects;

merge together a first of the communities and a second of the communities in response to a finding of similarity between the core objects in the first of the communities and the core objects in the second of the communities.

23. (Currently Amended) One or more tangible computer readable media as recited in claim [[0]] 22, wherein the merge results in a merged community including all of the objects of the first of the communities and the second of the communities and having a set of core objects that includes the core objects in the first of the communities and the core objects in the second of the communities.

24. (Previously Presented) One or more tangible computer readable media as recited in claim 22, wherein the plurality of instructions, when executed by the one or more processors, further cause the one or more processors to:

merge together a first of the communities and a second of the communities if there is sufficient similarity between the core and affiliated objects in the first of the communities and the core and affiliated objects in the second of the communities.

25. (Canceled)

26. (Previously Presented) One or more tangible computer readable media as recited in claim 22, wherein the link threshold comprises a minimum number of objects in the plurality of objects that must each link to each object in the group.

27. (Canceled)

28. (Currently Amended) One or more tangible computer readable media as recited in claim ~~[[0]]~~ 20, wherein a rank is assigned to each object in the second collection of objects, based on which object in the second collection of objects is assigned to a particular concentric portion around the center of the model.



29. (Currently Amended) A system to mine communities from a plurality of objects, the system comprising:

a processor; and

a memory coupled to the processor, wherein the memory includes one or more instructions that cause the processor to, at least:

identify, from the plurality of objects, one or more core object sets from the plurality of objects by identifying one or more objects that are referenced by at least a threshold number of other objects of the plurality of objects, wherein each core object set is incorporated into a respective data structure defining a community; and

for each of the core object sets, expand the respective data structure defining the community to include a set of affiliated objects, wherein the expansion is based on the core object set of the community, and the core object set and the associated set of affiliated objects are maintained as distinct entities within each respective data structure  
identify links between objects of the plurality of objects;

find groups of objects of the plurality of objects that satisfy a link threshold; and

identify, as a core object set, one or more of the groups of objects that satisfy the link threshold;

wherein the link threshold is determined by selecting a number of the plurality of objects that is at least 1% of the total number of objects in the plurality of objects and multiply an amplifying frequency factor by a weight sum of all links and divide it by the number of the plurality of objects selected.

30. (Original) A system as recited in claim 29, wherein the one or more instructions further cause the processor to:

repeat the identification and expansion for a plurality of communities of objects, wherein the objects in each community of objects are all from the plurality of objects.

31. (Canceled)

32. (Canceled)

33. (Currently Amended) A system implemented at least in part in a computing device, the system comprising:

a processor;

a core set identification module to identify core sets of objects for data structures corresponding to communities from a plurality of objects by identifying one or more objects that are referenced by at least a threshold number of other objects of the plurality of objects; and

a community expansion module to expand the data structures corresponding to the communities by adding sets of affiliated objects to data structures corresponding to the communities, wherein the expansion is based at least in part on at least one core set of objects, and each core set of objects and each set of affiliated objects is maintained as a distinct entity within respective data structures corresponding to communities; and

a core set merging module to merge together a first of the communities and a second of the communities in response to a finding of sufficient similarity between the core objects in the first of the communities and the core objects in the second of the communities;

wherein the finding of sufficient similarity is determined when smallest values from the first of the communities and the second of the communities divided by a set that includes all elements that the first and second communities have in common is less than two.

34. (Previously Presented) A system as recited in claim 33, wherein the core set identification module is further to:

identify links between objects of the plurality of objects;  
find groups of objects of the plurality of objects that satisfy a link threshold; and  
identify, as a core object set, one or more of the groups of objects that satisfy the link threshold.

35. (Previously Presented) A system as recited in claim 33, wherein the community expansion module is further to:

identify links between objects of the plurality of objects; and

for each community, identify one or more objects of the plurality of objects, wherein a link exists from each of the identified one or more objects to at least one of the objects of the core object set of the community, and

include, in the set of affiliated objects of the community, each of the identified one or more objects.

36. (Previously Presented) A system as recited in claim 33, wherein the core set merging module generates a merged community that includes all of the objects of the first of the communities and the second of the communities and has a set of core objects that includes the core objects from the first of the communities and the core objects from the second of the communities.

37. (Previously Presented) A system as recited in claim 33, further comprising:  
a community merging module to merge together a first of the communities and a second of the communities if there is sufficient similarity between the core and affiliated objects of the first of the communities and the core and affiliated objects of the second of the communities.

38. (Previously Presented) A computerized method comprising:  
grouping a first collection of a plurality of objects into a center portion;  
grouping a second collection of the plurality of objects into a plurality of concentric portions around the center portion so that all objects of the second collection that are grouped in a particular one of the concentric portions have a same rank; and  
in at least one tangible computer readable media, instantiating, and storing data associated with, a community of objects corresponding to a user interface independent model comprising the groupings of the first and second collections of the objects.

39. (Original) A method as recited in claim 38, wherein both the center portion and the plurality of concentric portions collectively are a set of concentric circles.

40. (Original) A method as recited in claim 38, wherein the center portion comprises a circle.

41. (Previously Presented) A method as recited in claim 38, wherein the plurality of concentric portions comprise a circle.

42. (Original) A method as recited in claim 38, wherein the first collection of the objects comprises a core set of objects.

43. (Original) A method as recited in claim 38, wherein each object of the second collection of the objects comprises an affiliated object.

44. (Presently Presented) One or more tangible computer readable media having stored thereon a plurality of instructions that, when executed by one or more processors of a device, causes the one or more processors to describe a community of objects by, at least:

creating a set of concentric circles;

assigning a group of core objects of the community to the center data circle of the set of concentric data circles; and

assigning a group of affiliated objects of the community to a plurality of data circles of the set of concentric data circles, wherein all of the objects of the group of affiliated objects having a same rank are assigned to a same one of the set of concentric data circles, and wherein the set of concentric data circles facilitates traversal of the community of objects independent of a user interface.

45. (Previously Presented) The computerized method of claim 1, wherein each at least one reference is associated with a weight corresponding to a type of the at least one reference that is independent of reference frequency.

46. (Previously Presented) The computerized method of claim 45, wherein:  
each weight corresponds to a numeric value; and  
the threshold number is a function of, at least, the numeric value corresponding to the weight associated with at least one reference.

47. (Previously Presented) The computerized method of claim 45, wherein:  
each weight corresponds to a numeric value; and  
each object in the community is ranked as a function of, at least, the numeric value corresponding to the weight associated with at least one reference to the object.

48. (Previously Presented) The computerized method of claim 45, wherein the data structure corresponding to the community of objects comprises:  
the set of core objects;  
the set of affiliated objects; and  
a programmatic function for measuring a degree of affiliation between two objects of the community based on, at least, the weight associated with at least one reference in a reference chain between the two objects.

49. (Currently Amended) The ~~computerized method of~~ system as recited in claim 29, wherein:

at least two core object sets are identified from the plurality of objects; and

a decision to merge the at least two core object sets is based on a set of conditions comprising a condition specifying that a ratio of a minimum size of one of the at least two core object sets to a size of an intersection of the at least two core object sets is less than 2.